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ABSTRACT

This study assessed the effectiveness of 5 hours of training on 3-year-old children's comprehension and production of the passive, negative, possessive, and negative passive syntactic structures. A comprehension test identified 20 children who did not evidence understanding of these structures. Subjects were then randomly assigned to experimental and control groups. Experimental subjects received daily training while subjects in the control group received no training. Toys in different arrangements served as exemplars of the structures. A re-administration of the comprehension test to all children after 3 weeks showed significant improvement among experimental subjects, who also performed well on a test for production of these structures. (A drawing illustrating the experimental process and data obtained from the language comprehension tests are provided.) (Author/MF)

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The Experimental Facilitation of Children's Comprehension and Production of Four Syntactic Structures

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This study assessed the effectiveness of five hours of training, distributed over three weeks, upon comprehension and production of four syntactic structures in three-year-old children. Recent literature on children's acquisition of grammar has stressed the unlearned, tacit, and innate aspects of grammatical ability. The implication from the writings of many in the area of psycholinguistics is that the environment exerts a relatively small influence upon children's initial development of basic grammatical skills. The present investigation was undertaken in order to test certain of the above assumptions, and with the hope of obtaining more information pertinent to the question of the influence of training conditions on the acquisition of four basic grammatical forms.

A group of 20 three-year-old white middle-class children were selected who earned less than 50% on a 24 item test for comprehension of four syntactic structures. Figure 1 contains

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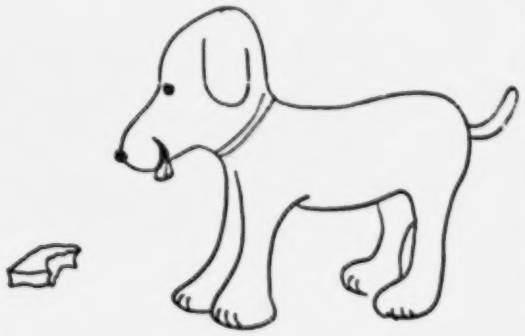
21. Candy is not eaten by the dog.

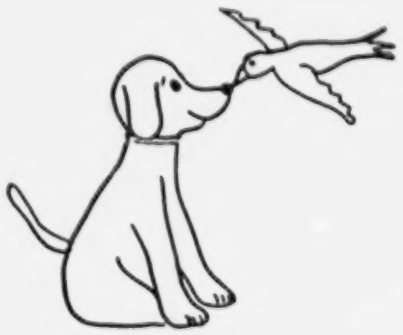
22. Snoopy is not kissed by the bird.

a.

a.



b.



b.

c.

c.

Nonreversible form

Reversible form

Fig. 1. Two items, representing the negative passive structure, from the language comprehension test.

two sample test items. Ten of these children were randomly assigned to each of experimental and control groups. The control subjects received no treatment; they were merely tested and then re-tested three weeks later.

The test for comprehension (understanding) of examples of the possessive, negative, passive, and negative passive syntactic structures was used as both a pre- and post-measure. It was similar to those of Fraser, Bellugi, and Brown (1963), Lovell and Dixon (1967), and Osser, Wang, and Zaid (1969). A test-retest reliability was first established on a group of 20 white middle-class children, aged 5 to 10. For these children, test-retest reliability was .89 over a three week interval. Additionally, a post-treatment measure of language production was employed. This production measure was similar to that employed by Turner and Rommetveit (1967).

During the three week training period, daily 20-minute sessions were conducted with each child in the experimental group. Training consisted of presenting the child with a series of examples of each structure. There were ten examples presented for each of the four syntactic structures. Each example was presented in the form of two sets of identical toys; one set of toys was arranged to represent the syntactic structure being taught, and the other set was grammatically irrelevant or illogical. The child was asked to point to the set which matched the sentence read to him. The case of the passive (reversible) structure will illustrate the procedure: a child

was shown a toy bear biting a toy tiger, and next to this display an identical toy tiger was shown biting a toy bear. The child was asked to find "The bear was bitten by the tiger." After each trial the toys were removed and re-presented in random left-right positions until the child made three correct identifications, which were rewarded. Incorrect identifications were followed by verbal explanations; furthermore the child was asked to imitate the correct choice and verbal response before a re-presentation of the toys. In this manner, the child's task was to acquire a recognition knowledge of ten examples of each of the four syntactic structures, then to generalize this knowledge to the different examples of each structure which appeared on the comprehension measure, and finally to produce still different instances of the structures in oral speech.

Table 1 presents the data obtained from the language comprehension test before and after treatment for experimental and control groups. Two t tests were employed to compare group differences on the pre- and post-measures of language comprehension. The t test prior to the experiment compared means of cells A and C in Table 1. The test demonstrated that experimental and control groups were not significantly different in language comprehension scores before the experiment (t=.76, 18 df, $p > .4$).

Another t test was employed to compare cells B and D

Table 1

Number of Correct Choices on the Language Comprehension Test: Means and Standard Deviations

	Pre-Test	Post-Test
Experimental Group	$\bar{X}$=8.20 S.D.=2.66 A	$\bar{X}$=15.90 S.D.=3.51 B
Control Group	C $\bar{X}$=9.10 S.D.=2.60	D $\bar{X}$=10.00 S.D.=3.53

in Table 1. This test revealed the experimental group to be significantly superior to the control group on the language comprehension test following the experimental treatment ($\underline{t}$=3.75, 18 df, $p < .001$).

That the control group did not significantly improve in language comprehension is attested to by the $\underline{t}$ test across cells C and D in Table 1 (correlated $\underline{t}$=1.06, 9 df, $p > .4$). This group's average proportion correct changed from .38 to .42.

It can be extrapolated logically that the comparison A B in Table 1 is significant. Nevertheless, the following $\underline{t}$ test was made. This test showed that the gain in mean score on the language comprehension test for the experimental group was significant (correlated $\underline{t}$=8.85, 9 df, $p < .001$). The average proportion correct for the experimental group changed from .34, a nearly chance performance on the pre-test, to .66 on the post-test.

Subjects receiving the language treatment were given an additional post-measure to determine whether they had acquired language production capability. This measure employed examples different from those used in training and different from the comprehension test. Semi-spontaneous responses were elicited by prompts. To the presentation of eight structured situations subjects average 6.2 correct oral responses containing the appropriate grammatical form. All subjects emitted at

least five of the eight forms of the four structures studied, after an average of 3.2 prompts per item. The control group was not given the production measure, for previous research (Fraser et al., 1963; Lovell and Dixon, 1967) has indicated that language production follows language comprehension, which control subjects failed to evidence.

Much attention has been devoted lately to the importance of the child's innate capacity for language acquisition. McNeill, Lenneberg, Deese, and Chomsky have emphasized the child's powers to induce the underlying rules and structures of their language. This group has minimized the role of the environment in language acquisition, especially in the acquisition of the basic syntactic structures of a language.

The author believes that the importance of the present study lies not in the fact that it questions a biological explanation for the language capacity which man possesses, but rather that it offers some evidence which bears on the question of the amount of influence of the environment upon this capacity. In a short three weeks, when subjected to training sessions which were designed to exemplify several principles of transfer of training (e.g., provide adequate experience with the original task; provide a variety of examples; label or identify the important features of a task), the children in the experimental group significantly improved their comprehension of the four syntactic structures. The

language treatment was sufficiently different from the test to allow the interpretation that this performance was a type of transfer of training. Furthermore, the children's performance on the language production test demonstrated a more extensive and complex transfer from the treatment.

Rather than attribute the acquisition of syntax in this study primarily to maturation, biological predisposition, or as Chomsky (1969) did for three other language structures, to "individual rate of development," the rapid acquisition found must certainly be attributed to favorable environmental stimulation.

Since the present experimental treatment produced significant and perhaps important gains in three-year-old children's initial comprehension and production of certain grammatical structures, it is reasonable to assume that much greater effects, perhaps socially significant ones, will result from longer and more intensive linguistic training at very young ages.

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